

CSC and GISC are inserted at different timing instants. In order to prevent other ordinary symbol portions from being affected, a masked symbol section **131** is made to have 256 chips in the same way as the conventional system. The CSC and GISC may be inserted in any section of four sections (**133**, **134**, **135** and **136**) obtained by dividing the mask symbol section at intervals of 64 chips. In the case where the symbol length of the GISC becomes short and consequently the number of GISCs is not enough for the number of classes of the long code which GISCs are assigned to, it is also possible to adopt such a method that long code identification groups are sorted out according to which of the four insertion sections they are inserted. In the masked symbol section, sections other than those of CSC and GISC are provided with no symbols.

If the symbol length is shortened, the number of times of possible accumulation times decreases. For obtaining the same receiving sensitivity, therefore, the transmission power must be raised. However, the perch channels are always subjected to transmission with constant power. In addition, the long code masked symbol portion is poor in orthogonality, and therefore, tends to exert interference power to other channels. Therefore, it is desirable to suppress the transmission power as low as possible. In the present embodiment, therefore, the CSC and GISC are not multiplexed, but the CSC and GISC are transmitted by time division in the long code masked symbol portion. Even if the spreading factor is reduced to  $\frac{1}{4}$  at this time, transmission power **P3** of the CSC is twice the transmission power **P1** of the conventional technique and the same reception sensitivity is obtained. The same is true of the transmission power **P4** of the GISC.

As a second embodiment, FIG. 4 shows a channel format and transmission power in the case where the spreading factors of the CSC and GISC are made sufficiently small (16 in the example) as compared with other symbols of the perch channels, and the CSC and GISC are multiplexed and transmitted. It is necessary to make transmission power **P5** of the CSC and transmission power **P6** of the GISC large so as to correspond to the spreading factors. If the symbol rate of channels other than perch channels is fast, then the number of perch channels which are affected by the fact that the perch channel power is increased will become large. In such a case, by multiplexing the CSC and GISC to shorten the section in which the transmission power becomes large as in the present embodiment, although the influence of the perch channels on other channels may be large, the shortening of the affecting symbol section surely causes influence as a whole to be lightened.

As a third embodiment, FIG. 5 shows a channel format and transmission power in the case where the spreading factors of the CSC and GISC are made sufficiently small (64 in the example) as compared with other symbols of the perch channels, and the GISC is repeated a plurality of times (three time in the example). By transmitting the GISC repetitively  $n$  times, the number of accumulation times is increased, and accordingly transmission power **P8** of the GISC of one time is equal to  $1/n$  of transmission power **P7** of the CSC. As a result, influence on other channels is suppressed.

As a fourth embodiment, FIG. 6 shows a channel format and transmission power in the case where the spreading factor of the CSC is made smaller than that of the GISC (in the example, the spreading factor of the CSC is 64 and the spreading factor of the GISC is 256).

In the above described three stages of the cell search, the GISC detection can be conducted by despreading only at

timing designated from the CSC, and a correlator is used instead of the MF in many cases (as shown in FIG. 10, for example). As in the present embodiment, therefore, the speed of the search can be raised while suppressing the interference on other channels, by making the spreading factor of the CSC affecting the number of taps of the MF small and making the spreading factor of the GISC larger than it in order to suppress the transmission power.

In FIG. 7, there is shown a list of time required at each stage of the cell search obtained when the spreading factor of the long code masked symbol and the number of taps of the MF are changed.

By thus making the spreading factor of the long code masked symbol small, the time required for timing synchronization can be made shorter than that of the conventional method, and the number of taps of the MF can be shortened, resulting in reduced gate size and power consumption.

The present invention has been disclosed in connection with the preferred embodiments. Those skilled in the art can apply various modifications to the embodiments on the basis of the disclosure. All modifications existing within the true spirit and scope of the present invention are incorporated in the claims.

What is claimed is:

1. A mobile terminal used in a code division multiple access mobile communication system, in which a base station transmits a control signal via perch channels formed such that a long period code assigned to said base station and a first short period code are mapped in a first section of one slot of said perch channel and a predetermined short period code is mapped in a second section of said one slot, said mobile terminal comprising:

an RF unit for converting a received signal of a carrier frequency received from an antenna to a baseband signal; and

a matched filter for receiving input of said baseband signal and calculating a correlation value for said baseband signal by using said predetermined short period code to establish slot timing synchronization,

wherein a symbol length of said predetermined short period code has a smaller value than a symbol length of said first short period, and

wherein in said second section are mapped a second short period code, and a third short period code being one of a plurality of short period codes each corresponding to classification of the long period code spreading said first section.

2. A mobile terminal used in a code division multiple access mobile communication system in which a base station transmits a control signal via perch channels formed such that a long period code assigned to said base station and a first short period code is mapped in a first section of one slot of said perch channel and a predetermined short period code is mapped in a second section of said one slot, said mobile terminal comprising:

an RF unit for converting a received signal of a carrier frequency received from an antenna to a baseband signal; and

a matched filter for receiving input of said baseband signal and calculating a correlation value of said baseband signal and said predetermined short period code, wherein the number of taps of said matched filter is smaller than a spreading factor of said long period code of said control signal.

3. A mobile terminal used in a code division multiple access mobile communication system in which a base sta-